Link to Download Desktop Software:
WWW.SUPPORT.NOMADIO.NET/REACT

NOMADIO
telemetry and control systems

REACT
THE FASTEST RADIO IN R/C. PERIOD.

User's Guide

NOMADIO
+
up
menu
cancel
default
-
down
NOMADIO

Link to Download Desktop Software:
WWW.SUPPORT.NOMADIO.NET/REACT

Copyright 2006 Nomadio
Published November, 2006

Table of Contents

Getting to Know Your React 7
Power Switch 7
Display Screen 7
Navigation Buttons 8
Selection Buttons 8
Trim Buttons 9
Grip Buttons 9
Charging and Installing Batteries 9
Installing the Batteries 9
Charging the Batteries 10
Installing the Transceiver 11
Mounting the Transceiver 11
Connecting the Transceiver 11
Servo Connection 12
FCC Compliance Reminder 12
Installing the Optional Sensors 12
Receiver Battery Sensor 12
Voltage Sensor 12
Temperature Sensor 13
Installation 13
Connection 13
Tachometer Sensor 14
Installation 14
2. Install the magnets 14

Connection 15
Connecting the Tach Sensor 15
Binding the Transceiver 16
How the Binding Process Works 16
Binding your transceiver the first time 16
React Controls 16
Top Menu Level 18
Steering Functions 18
Steering Trim 18
Adjusting Steering Trim using the Function Menu 19
Adjusting Steering Trim using the Steering Trim Buttons 19
Steering Dual Rate 20
Adjusting Steering Dual Rate using the Function Menu 21
Adjusting Steering Dual Rate using the Trim Buttons 22
Dual Rate and End Point Adjustment 22
Steering Exponential 22
Adjusting Steering Exponential 23
Steering Sub-Trim 23
Adjusting Steering Sub-trim 24
Trim and EPA Interaction 24
Steering Left End Point 25
Use the navigation controls to adjust the left end point as follows: 26
Trim and EPA Interaction 26
Steering Right End Point 27
Trim and EPA Interaction 28
Steering Servo Reverse 29
Changing the Steering Servo Reverse Setting 29
Steering Servo Type 29
Changing the Steering Servo Type 29
Steering Speed 30
Changing the Steering Speed 31
Throttle Functions 33
Throttle Trim 33
Adjusting Throttle Trim using the Function Menu 34
Adjusting Throttle Trim using the Trim Button 35
Trim and EPA Interaction 35
Throttle Dual Rate 35
Adjusting Throttle Dual Rate using the Function Menu 36
Adjusting Throttle Dual Rate using the Trim Button 36
Dual Rate and End Point Adjustment 36
Throttle Exponential 36
Adjusting Throttle Exponential 38
Brake Exponential 38
Adjusting Brake Exponential 39
Throttle Sub-Trim 40
Adjusting Throttle Sub-trim 40
Trim and EPA Interaction 41
Adjusting Throttle Dual Rate Increment 41
Brake End Point 42

Adjusting the Brake End Point 43
Trim and EPA Interaction 43
Throttle End Point....44
Adjusting the Throttle End Point....46
Trim and EPA Interaction 47
Throttle Dual Rate Mode....47
Changing the Throttle Dual Rate Mode....47
Throttle Servo Reverse....47
Changing the Throttle Servo Reverse Setting 47
Throttle Servo Type 48
Changing the Throttle Servo Type....49
Throttle Speed....49
Changing the Throttle Speed....51
Interaction with other Settings....51
Channel 3 and Channel 4 Servo Functions 51
Channels 3 / 4 Servo Trim....52
Adjusting Channel 3 / 4 Servo Trims 52
Trim and EPA Interaction 53
Channel 3 / 4 Servo Dual Rate 53
Adjusting Channel 3 /4 Servo Dual Rate 53
Dual Rate and End Point Adjustment....54
Low End Point 54
Adjusting the Low End Point 55
High End Point 56
Adjusting the High End Point 57
Channel 3 / 4 Dual Rate Mode 58
Changing the Channel 3 / 4 Dual Rate Mode....58
Channel 3 /4 Servo Reverse 58
Changing the Channel 3 / 4 Servo Reverse Setting 58
Channel 3 / 4 Servo Type....59
Changing the Channel 3 / 4 Servo Type 59
Channel 3 / 4 Servo Model 60
Changing the Channel 3 / 4 Servo Mode....60
Channel 3 / 4 Servo Speed 61
Changing the Channel 3 / 4 Servo Speed....61
Interaction with other Settings.... 62
Advanced Features....62
Event Summary....63
Event 63
Idle Up.... 64
Configuring Idle Up....64
AutoStart....65
Configuring AutoStart....65
Antilock Braking System (ABS)....65
Configuring ABS 65
Failsafes 66
Setting Failsafe Modes 67
Setting Failsafe Positions....67
Calculation method 69

Measurement method....69
Tach (RPM)....70
Tank Mode.... 71
Activating / Deactivating Tank Mode....71
Using The Timer Function....71
Model Management....71
Active Model....72
Selecting the Active Model....73
New Model....73
Creating a New Model....74
Delete Model....74
Deleting a Model....74
Copy Model....75
Copying a Model....75
Rebinding....76
Rebinding to a Model....76
Controller Setup....76
Vibrator....77
Contrast.... 77
Adjusting the Display Contrast Level....77
Units....78
Selecting Unit System....78
Calibrate.... 78
Recalibrating the React....78
About....79
Viewing the React About Screen....79
React Digital RC Desktop....80
Minimum System Requirements....80
Installing the RC Desktop....80
Connecting the React to your Computer....84
2. Plug the smaller end of the included USB cable into the cable with the matching USB connector inside the React's battery compartment.... 84
Using the React Digital RC Desktop....84
Registration....85
Registering a Second Computer....87
Receiving Settings From the React....87
Editing Settings....87
Using Softkeys....89
Saving Settings....90
Sending Settings to the React....90
Installing React Firmware....90
Specifications....91
React Controller....91
Transceiver....91
Support....91
Statement of Compliance....94
FCC Compliance Statement....94
RF Exposure Statement....94
Modular Approval Statement....94

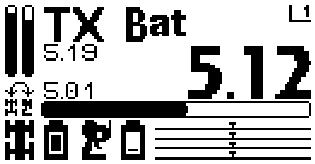
Racing Association Approvals 95
Nomadio 1 Year Limited Warranty 95
Warranty Coverage 95
Exclusions and Limitations 96
Consumer Protection Laws 97
Obtaining Warranty Service 97

Getting to Know Your React

Power Switch

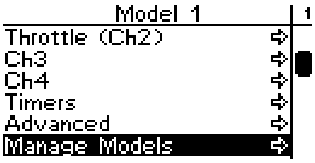
This switch turns the React on and off. It is recessed to prevent accidental switching during travel or use.

Display Screen



Driving Screen

This is the screen you'll be seeing 95% of the time while using the React. It displays radio and battery status, telemetry data that you select and your servo information.



Menu Screen

This screen is the gateway to the React's menu system, which is described in detail later. You can always go back to the driving screen by just pressing the menu key.

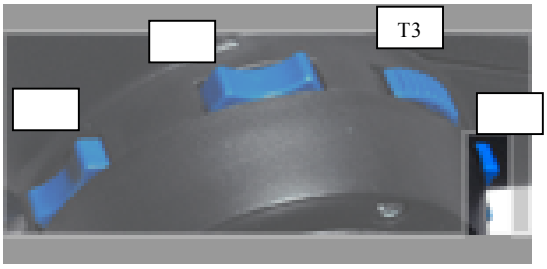
Navigation Buttons

Button	In the drive screen	In the function menu
		Moves to next higher menu item
		Moves to next lower menu item
	Displays previous reading	Decreases selected value
	Displays next reading	• Increases selected value • Goes to next submenu
		• Goes to selected submenu • Saves the change to the selected setting

Selection Buttons

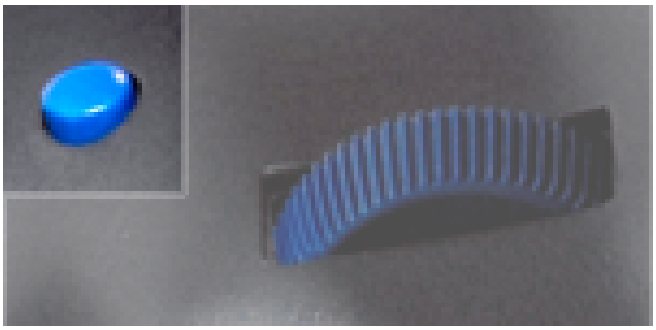
Button	In the function menu
	Sets the currently edited value to its maximum value
	Sets the currently edited value to its minimum value
	Cancels any changes made and resets value to where it was before editing started
	Resets the value to its factory default

Trim Buttons



Button	In the drive screen
T1	Adjusts the steering trim
T2	Adjusts the steering dual rate setting
T3	Adjusts the throttle dual rate setting
T4	Adjusts the throttle trim

Grip Buttons



Performs shifting action on channel 3

Charging and Installing Batteries

The React is powered by a 4 cell battery pack(included).

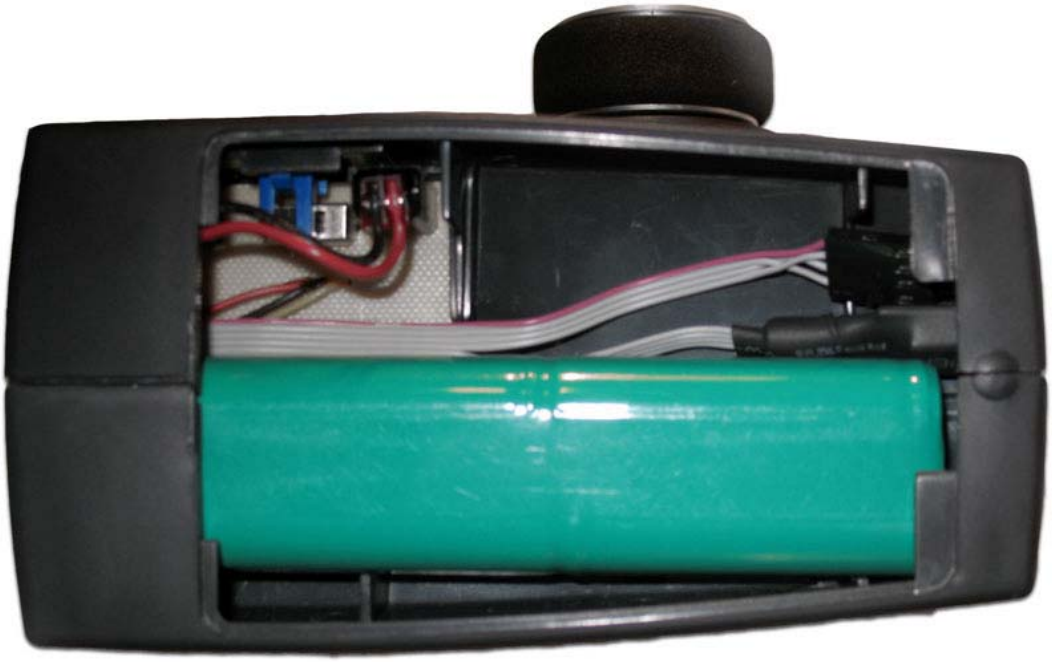
Also inside the battery compartment is the 4 wire Receiver Programming Cable. This cable can be plugged into the receiver's TACH pins in order to upgrade the software on the receiver. The RC Desktop will instruct you when a software upgrade is available.

Installing the Batteries

1. Plug the battery connector into the receptacle in the battery compartment. Refer to photo for battery installation.

Warning!!!! Plugging the battery in backwards will damage the React!!!!!!!!

2. Place the battery holder in the battery compartment. Make sure the wires do not pinch.
3. Slide the battery compartment cover into place.



Charging the Batteries

Make sure the Nomadio React battery pack is properly installed and the React is switched off. Batteries other than the Nomadio React battery pack cannot be charged by the React, and attempting to do so will void the warranty. Batteries other than the Nomadio React battery pack must be removed prior to connecting over USB for any reason, even when just using RC Desktop.

Connect the USB cables and insert the USB cable into a PC or powered USB hub.

The React will sense a low battery, and will begin charging automatically. To manually begin charging a battery, hit the "+" key.

The LCD status will display "Charging", and the timer at the bottom of the screen will begin. Charging a fully depleted battery should take between 4 and 6 hours.

When the React senses that a battery is fully charged, the LCD status will display "Charge Done" and will stop charging.

It is safe to manually stop the charging process, by hitting the "-" key.

If charging fails for any reason, the LCD status will display "Charge Fault". If this occurs, verify that:

You are using the Nomadio React battery pack.

The battery pack is properly installed.
The USB cables are connected properly.

Installing the Transceiver

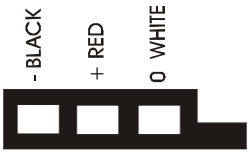
Mounting the Transceiver

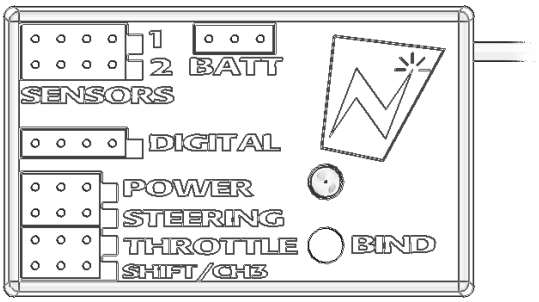
- Install the transceiver so it is protected from vibration or shock.
- Use double-sided tape or Velcro® to mount the transceiver.
- Position the transceiver where it will not contact other solid components.
- Mount the transceiver away from moving parts, sharp corners, and possible contaminants (fuel, dirt, etc.).
- When possible, waterproof and protect the transceiver by wrapping it in foam rubber and placing it in a rubber balloon or plastic bag. If you accidentally get moisture or fuel inside the transceiver, intermittent or erratic operation may result.
- Position the transceiver so the sensors can be easily connected to it.

Antenna

- The thinner portion at the end of the antenna wire must be outside the vehicle body
- DO NOT CUT the antenna wire

Connecting the Transceiver





Servo Input Plugs

The transceiver is designed to use Futaba J-style input plugs with wiring order as shown in the diagram.

Servo lead wires **MUST** be in this order. If the servo wires are in a different order, you must re-order the wires in the input plug. Check with your servo manufacturer about the color and order of the servo lead wiring.

When you insert the servo input plug into the transceiver, note that the input plug may have an alignment tab. Orient the alignment tab properly before inserting the input plug.

To remove in input plug from the transceiver, pull the input

	plug rather than the servo wires.

Servo Connection

Connect the servos to the appropriate positions in the transceiver:

Connect…	…into transceiver receptacle
Receiver battery / Channel 4 servo	"Power"
Steering servo	"Steering"
Throttle servo or ESC	"Throttle"
Shifting servo	"Shft/CH3"

FCC Compliance Reminder

If you install the React transceiver inside of a vehicle, and you are not the final end user, FCC regulations require you to make the React Transceiver's FCC ID easily visible to the end user. See the FCC Compliance section for more information:

Installing the Optional Sensors

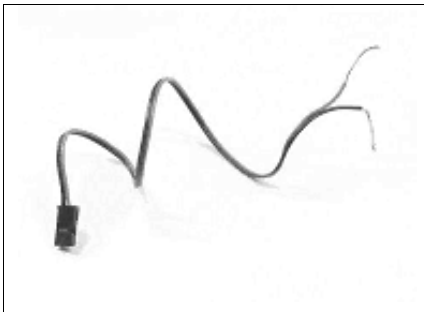
Your React radio system has several optional sensors that you can install in your vehicle and connect to the transceiver. When properly installed and connected, these sensors will send information back to the React so that you can monitor the readings while you drive.

Receiver Battery Sensor

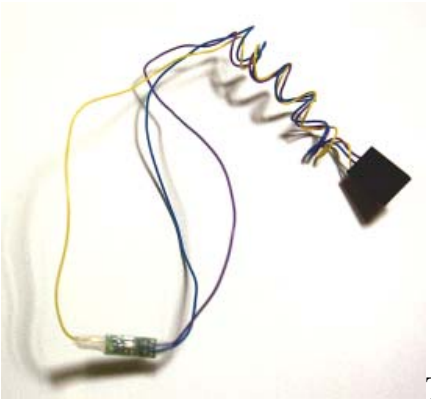
The transceiver monitors the receiver battery voltage from the POWER receptacle. There is no installation necessary for this sensor.

Voltage Sensor

The voltage sensor is used to monitor the voltage of a separate battery pack (for example, an electric car's main battery pack). In a Nitro car, this sensor is not needed.

	Connecting the Voltage Sensor 1. Connect the RED wire of the voltage sensor to the positive terminal and the BLACK wire of the voltage sense to the negative terminal of the battery pack you want to monitor. 2. Carefully route, protect, and secure the sensor wires. 3. Plug the voltage sensor into the BATT receptacle. If your voltage sensor only has two wires, connect the RED wire to the center pin and the black wire to either outside pin.

Temperature Sensor

 The temperature sensor is used to monitor the temperature of a vehicle component such as a main battery pack, electric motor, or nitro engine.

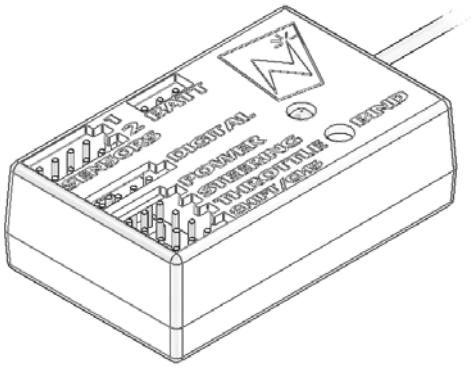
Installation

The green circuit board of the sensor is the active measuring element. Install the sensor so that this board is pressed against the item whose temperature you wish to measure.

The sensor has been designed to be thin enough to fit between the fins on a heat sink. The mounting wires are strong enough to be used to hold the sensor in place by wrapping them around a cylinder head or ESC heat sink. Alternately, a high-temperature epoxy may be used to secure the sensor.

When installing on a nitro motor, place the sensor as low as possible on the head, opposite the exhaust port. The sensor may also be installed on an electric motor, battery pack, or ESC heat sink.

Connection

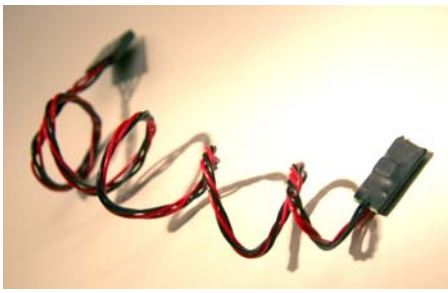


After you install the temperature sensor in the vehicle, plug it into the “Sensor 1” or “Sensor 2” receptacle.

The four-pin connector on the sensor cable has only three wires populated. The unpopulated pin should be the one furthest from the connector key in the receiver plastic.

The React transceiver will automatically detect which sensors are installed.

Tachometer Sensor



The tachometer ("tach") sensor is used to monitor the rotation speed of a vehicle component such as a drive shaft and this speed is converted into vehicle speed.

You will need to measure the distance your model rolls in order to provide the React with enough information to give you an accurate speed. We recommend that you get a tape measure and measure several rotations of the wheel to reduce the measurement error.

Installation

1. Choose the mounting location

In the drive train, after any clutch or transmission. We recommend that you do not try to mount the magnets on your motor for magnetic reasons (electric motors) and balance reasons (nitro motors).

Smaller diameter mounting points are better.

The tach sensor must be able to be mounted within 1-2mm of the magnet surface, so you'll need a solid mounting point that can position the sensor in the right place.

The completed installation should be rigid enough that proximity is maintained without the magnets impacting the sensor.

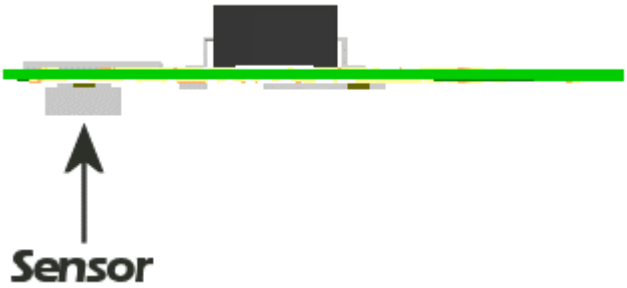
2. Install the magnets

Stick two magnets together, mark the exposed faces, then separate them.

Install the magnets with the marked sides out, exactly 180º apart to preserve rotational balance. IMPORTANT: For correct operation, the sensor must see alternating north and south magnetic poles.

Ideally, countersink the magnets into the surface.

3. Install the tach sensor



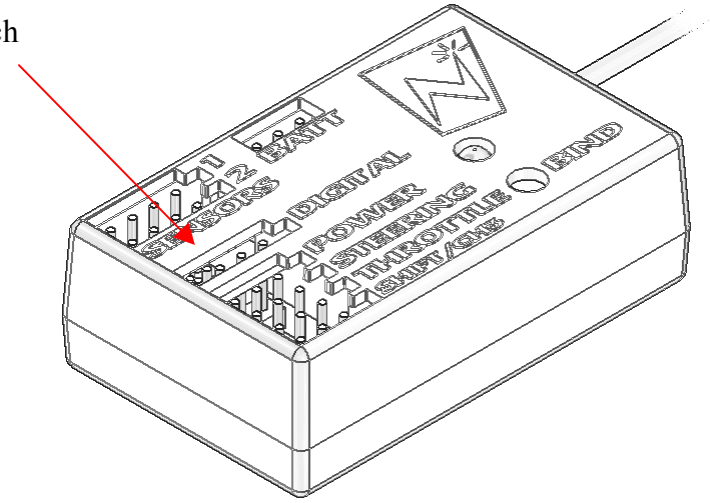
The sensor side of the tach circuit board must be mounted closest to magnets. The sensor is on the opposite side from the large chip that protrudes from the shrink tubing. The graphic above shows where the sensor is so you can mount it correctly.

When moving, the magnets should pass directly over the center of the sensor.

We have used a variety of methods of mounting tach sensors, depending on the car and the chosen location. Some ideas include cable ties, epoxy/hot glue, wire, making a wooden housing that holds the sensor in a specific place, etc. The only “wrong” way to mount it is if the magnets hit the sensor or are too far away, or if the sensor moves while the car is running.

Connection

Connect
optional Tach



Connecting the Tach Sensor

After you install the tach sensor in the vehicle, plug it into the “DIGITAL” receptacle.

Plug connector into transceiver – tachometer connector pin 1 (designated with a red wire and an arrow on the connector body housing) corresponds with the keyed end of transceiver digital port connector (labelled “digital”). The transceiver will automatically detect which sensors are installed.

Test your sensor’s installation

Power on React and transceiver and bind them

Verify communication between tachometer and transceiver by selecting RPM reading from drive screen

Correct mechanical installation can be verified by noting RPM value changes on your controller screen while you spin the wheels of your model.

If you don't see changing RPM values, the magnets or sensor are out of position, or the sensor could be plugged into the wrong sensor port on your transceiver. If your magnets are hitting the sensor or a part of your car when the wheels are turning, you must re-mount them so they do not hit anything.

Binding the Transceiver

The binding process "locks" the React and a transceiver together so that they listen only to each other.

Since the React has forty model memories, it is possible that your React will be used to communicate with as many as forty transceivers. You must therefore perform the binding process once for each transceiver that will communicate with your React.

Note that the React cannot communicate with all of the transceivers at the same time, but rather the React will communicate only with the transceiver associated with the React's currently active model. For more information, see "Managing Models" later in this instruction manual.

How the Binding Process Works

The binding process is set in motion by depressing the "bind" button on the transceiver when the React is in "bind mode." This clears the React ID saved on the transceiver, and allows it to connect to a React.

When in "bind mode" the React will listen for messages from interested transceivers. When a message is received the transceiver VIN (the number under the barcode on the FCC label) is displayed, and you are given the option of connecting to that transceiver or looking for another.

Now, every time you turn on the React and set it to the appropriate model ID (see "Managing Models" later in this manual), the React sends messages to the appropriate VIN. When you turn on the vehicle's transceiver, the transceiver looks for messages from the bound React only.

Binding your transceiver the first time

1. Install a transceiver into your vehicle. (For this example, install a transceiver into your electric touring car, which will be known to the React as "Model 1.")

2. In the React's "Manage Models" function menu, go to "Active Model" and select the appropriate model ID for the vehicle you are going to bind to. (For this example, select "Model 1.")

3. After putting your model on a stand to prevent runaways, power up the vehicle and transceiver.

4. In the React's "Manage Models" function menu, select "Rebind."

5. Depress and hold the transceiver's "bind" button until the onboard LED illuminates (you can use an extended paperclip, ball point pen, small screwdriver, etc).

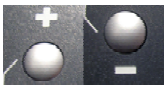
6: Confirm binding on your React by pressing the "OK" button as the transceiver VIN number is displayed.

The binding process is now complete.

React Controls

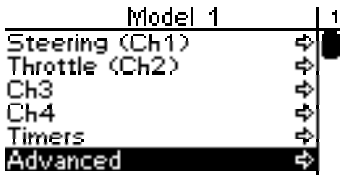
The functions of the React are controlled through the function menu and/or trim controls.

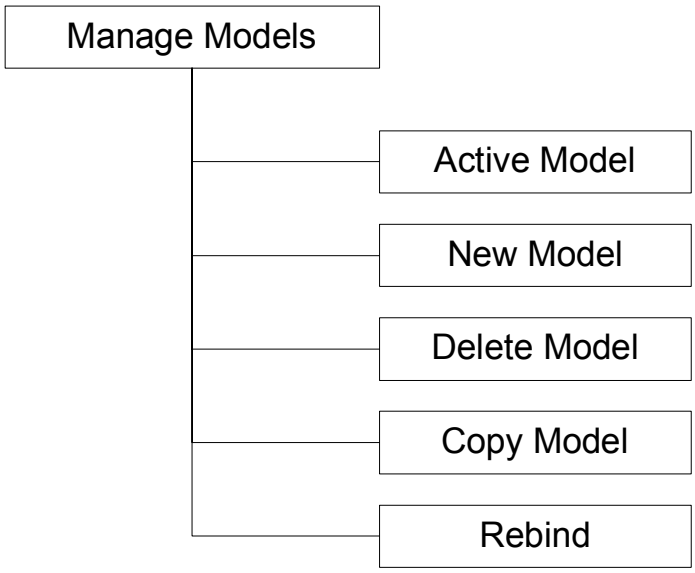
To perform this action...	Press.....

Toggles between the driving screen and the function menu or returns to the previous level from a sub-menu	
Menu: Go to the selected sub-menu	
Menu: Move to the next higher menu item.	
Menu: Move to the next lower menu item.	
Menu: Go to the selected sub-menu. Drive: Display next statistic.	
Menu: Decrease the selected value setting. Drive: Display previous statistic.	
Menu: Set currently edited value to maximum.	
Menu: Set currently edited value to minimum.	
Menu: Cancel changes made to the current parameter.	
Menu: Reset currently edited value to factory default.	

Top Menu Level

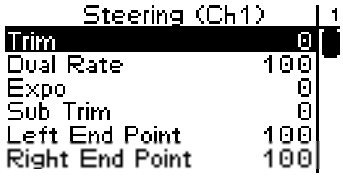
The following illustration shows the function menu structure for the top-level menu. All main sub-menus may be accessed from the top menu level. Channels 3 & 4 have identical setups, and are documented together.





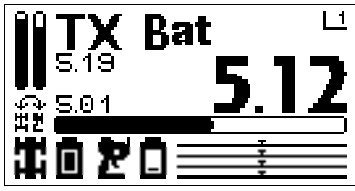
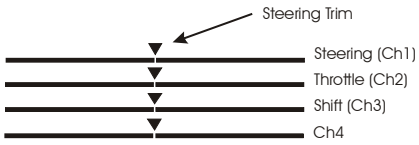
Steering Functions

Steering Trim



Steering trim adjusts the center point of the steering servo by adjusting the center point within the steering servo's total travel range. Unlike steering sub-trim, the steering left and right end points are unaffected by steering trim; by moving the center point of the steering servo using trim, the center position moves closer to one end point or the other.

Steering trim should be used only after you have initially adjusted steering sub-trim.

		On the driving screen, steering trim is represented by the position of the pointer on the upper bar.

As you change the steering trim, it is shown graphically on the driving screen trim indicator bars:

	Steering trim is centered in range (value = 0)
	Steering trim is offset to the RIGHT (+ve value
	Steering trim is offset to the LEFT (-ve value)

If you find that you have to use a large amount of steering trim to get the vehicle to drive straight, you should consider resetting the steering trim to 0 and re-adjusting the servo horn on the servo output shaft.

Adjusting Steering Trim using the Function Menu

Use the navigation controls to adjust steering trim as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

or

then

3. Navigate to **Trim**.

or

4. Change the value.

or

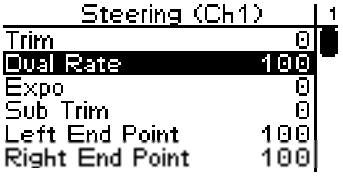
Value	Description
0	Steering trim is centered within the servo range.
-ve value (-100 → -1)	Steering trim is to the LEFT.
+ve value (1 → 100)	Steering trim is to the RIGHT.

Adjusting Steering Trim using the Steering Trim Buttons

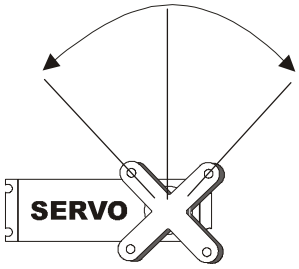
Push the trim button forward to advance the trim, backward to reduce it.

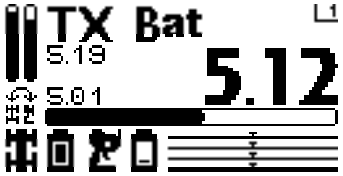
A trim (or sub-trim) setting of 100 is equivalent to an End point setting of 50.

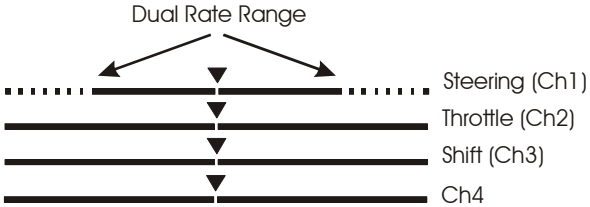
Steering Dual Rate



Steering dual rate adjusts the range of servo movement when the steering wheel is fully turned in either the left or right direction. This is used to increase or decrease the steering sensitivity across the entire servo range. The steering dual rate value is applied to both left and right sides, and is expressed as a percentage of servo range (configured by end point adjustments).







On the driving screen, steering dual rate range is represented by the solid length of the upper bar.

The total length of the bar (solid and dotted) represents the servo range. The length of the solid bar represents the range set by the dual rate value.

As you change the dual rate setting it is shown graphically on the driving screen trim indicator bars:

	Full servo range is used.
	Lower dual rate value reduces servo range.

Adjusting Steering Dual Rate using the Function Menu

Use the navigation controls to adjust steering dual rate as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

or

: then

3. Navigate to **Dual Rate**.

or

4. Change the value.

or

Value	Description
0	Steering servo range is set to minimum.
1-99	Steering servo range is set to a percentage of full range. For example, value “50” gives 50% of full servo range.
100	Steering servo range is set to full (100%)

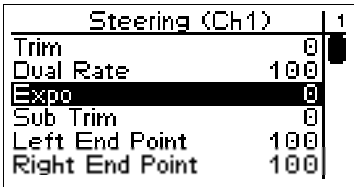
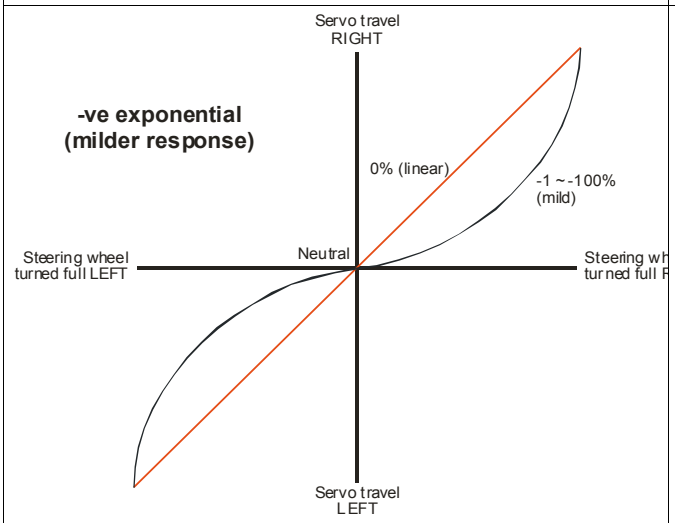
Adjusting Steering Dual Rate using the Trim Buttons

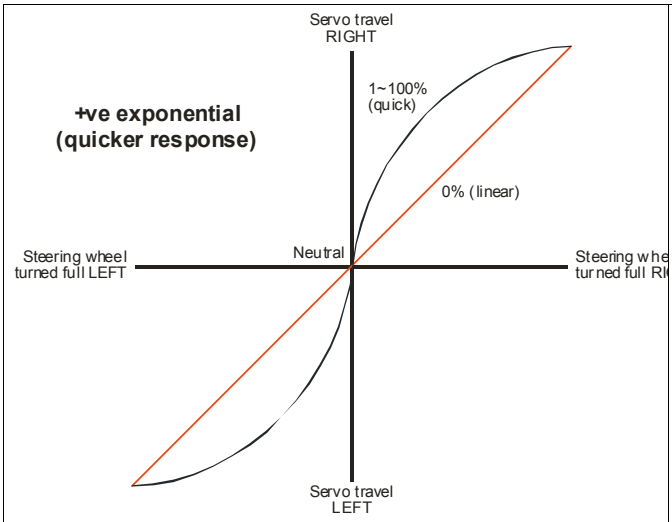
You can also use the T2 trim button to adjust the steering dual rate.

Dual Rate and End Point Adjustment

Full servo range is determined by the left and right end point adjustments. The dual rate value determines the relative servo range between the left and right end points. The servo will never move beyond the set end point adjustments, no matter what dual rate setting is applied.

Steering Exponential

	Steering exponential adjusts how quickly or slowly the steering servo responds with respect to the amount that the steering wheel is turned. This affects the sensitivity of the steering servo near its neutral position (center). Adjusting the steering exponential value affects both left and right steering response at the same rate.
	A negative (-ve) exponential value gives a milder steering response near the steering neutral point, making it LESS responsive to small steering inputs, without affecting total travel like Dual Rate would.



A positive (+ve) exponential value gives a quicker steering response near the steering neutral point, making it MORE responsive to small steering inputs, without affecting total travel like Dual Rate would.

Adjusting Steering Exponential

Use the navigation controls to adjust steering exponential as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

or

then

3. Navigate to **Expo**.

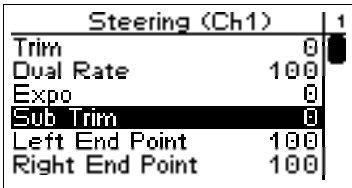
or

4. Change the value.

or

Value	Description
0	Neutral steering response (linear).
-ve value (-1 to -100)	Milder steering response near center.
+ve value (1 to 100)	Quicker steering response near center.

Steering Sub-Trim



Steering sub-trim adjusts the center point of the steering servo. This differs from steering trim in that steering sub-trim adjusts the servo's entire travel range; by moving the center point of the servo, the left and right end points (left, right) stay the same relative "distance" from the

	servo center.	

Steering sub-trim should be initially adjusted after you have assembled your vehicle's steering system; after you begin driving the vehicle, use steering trim to make fine adjustments to center the steering within the total steering range. If you find that you have to use a large amount of steering sub-trim to get the vehicle to drive straight, you should consider resetting the steering sub-trim to 0 and re-adjusting the servo horn on the servo output shaft.

Adjusting Steering Sub-trim

Use the navigation controls to adjust steering sub-trim as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

or

then

3. Navigate to **Sub Trim**.

or

4. Change the value.

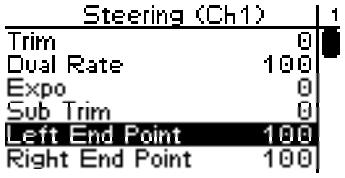
or

Value	Description
0	Steering sub-trim is centered within the servo range.
-ve value (-100 → -1)	Steering sub-trim is to the LEFT.
+ve value (1 → 100)	Steering sub-trim is to the RIGHT.

Trim and EPA Interaction

A trim (or sub-trim) setting of 100 is equivalent to an End point setting of 50.

Steering Left End Point

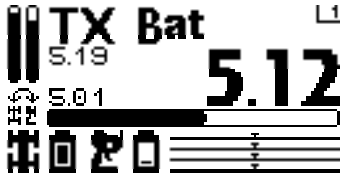


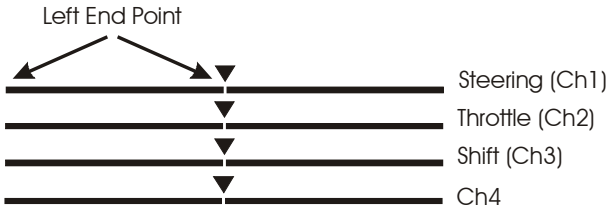
The steering left end point value adjusts how far the steering servo turns to the LEFT with respect to its full range of motion to the left. End point adjustment should be adjusted prior to other steering settings, as the left end point value affects other steering settings.

The left end point is set independently of the right end point (which adjusts how far the steering servo turns to the RIGHT). The left end point setting should be used to do the following:

Limit steering throw to reduce mechanical binding or servo strain that may occur on full servo throw to the left. For example, if the servo is trying to turn the steering system to the left farther than it is mechanically able.

Adjust steering throw to change steering characteristics when turning to the left.
For example, if the current amount of steering throw to the left causes oversteer or understeer when turning to the left.





On the driving screen, the left end point is represented by the length of the bar to the left of the pointer on the upper bar.

The greater the left length of the bar, the greater the left end point value.

The position of the pointer on the bar is affected

	by the end point settings (left and right) and trim settings.

Changing the left end point value has the following visual effect on the driving screen bars.

	Left end point value is approximately the same as the right end point value.
	Increased left end point value (more servo travel to the left is possible).
	Decreased left end point value (less servo travel to the left is possible).

The position of the pointer on the bar is affected by the steering end point settings (left and right) and trim setting; increasing the left end point value may visually appear to have the same effect as decreasing the right end point value.

An end point setting of 100 (the default) is typical for most servos, and should always be used for ESCs. Larger setting values will overdrive most servos.

Use the navigation controls to adjust the left end point as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

or

then

3. Navigate to **Left End Point**.

or

4. Change the value.

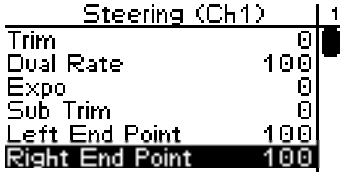
or

Value	Description
0	Minimum left end point; allows NO turning motion to the left.
1-200	Left end point value is set to a percentage of full left-turning range.
200	Maximum left end point (will overdrive most servos)

Trim and EPA Interaction

A trim (or sub-trim) setting of 100 is equivalent to an End point setting of 50.

Steering Right End Point

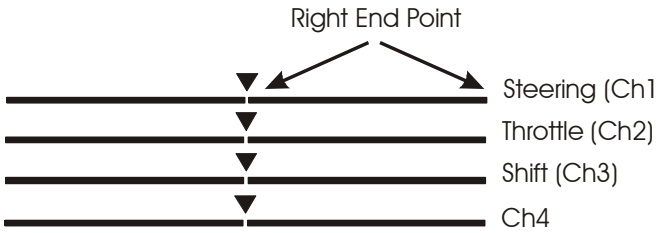


The steering right end point value adjusts how far the steering servo turns to the RIGHT with respect to its full range of motion to the right. End point adjustment should be adjusted prior to other steering settings, as the right end point value affects other steering settings.

The right end point is set independently of the left end point (which adjusts how far the steering servo turns to the LEFT). The right end point setting should be used to do the following:

Limit steering throw to reduce mechanical binding or servo strain that may occur on full servo throw to the right. For example, if the servo is trying to turn the steering system to the right farther than it is mechanically able.

Adjust steering throw to change steering characteristics when turning to the right.
For example, if your car is oversteering when turning to the right, then reduce the Right End Point value to reduce the range of the steering servo on the right.



On the driving screen, the right end point is represented by the length of the bar to the right of the pointer on the upper bar.

The greater the right length of the bar, the greater the right end point value.

The position of the pointer on the bar is affected by the end point values (left and right) and trim setting.

Changing the right end point value has the following visual effect on the driving screen bars.

	Right end point value is approximately the same as the left end point value.
	Increased right end point value (more servo travel to right is possible).
	Decreased right end point value (less servo travel to right is possible).

The position of the pointer on the bar is affected by the steering end point values (left and right) and trim setting; increasing the right end point value may visually appear to have the same effect as decreasing the left end point value.

An end point setting of 100 (the default) is typical for most servos, and should always be used for ESCs. Larger setting values will overdrive most servos

Use the navigation controls to adjust the right end point as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

or

then

3. Navigate to **Right End Point**.

or

4. Change the value.

or

Value	Description
0	Minimum right end point; allows NO turning motion to the right.
1-200	Right end point setting is set to a percentage of full right-turning range.
200	Maximum right end point (will overdrive most servos)

Trim and EPA Interaction

A trim (or sub-trim) setting of 100 is equivalent to an End point setting of 50

Steering Servo Reverse

Steering (Ch1) 1 Dual Rate 100 Expo 0 Sub Trim 0 Left End Point 100 Right End Point 100 Reverse Off	Steering Servo Reverse reverses the direction the servo moves upon receiving an input from the steering wheel.	

Changing the Steering Servo Reverse Setting

Use the navigation controls to change the steering servo reverse setting as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

or

then

3. Navigate to **Servo Reverse**.

or

4. Change the value.

Value	Description
Off	Standard servo direction.
On	Reversed servo direction.

Steering Servo Type

Steering (Ch1) 1 Expo 0 Sub Trim 0 Left End Point 100 Right End Point 100 Reverse Off Type Digital	Steering servo type lets you select the type of steering servo (analog or digital) in the vehicle. Analog servos are sent signals at 50 frames/sec, while Digital servos are sent signals at 100 frames/sec. If you have high-end analog servos, they may operate better with the digital setting, try both settings and choose the best performance.

Changing the Steering Servo Type

Use the navigation controls to change the steering servo type as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

or

then

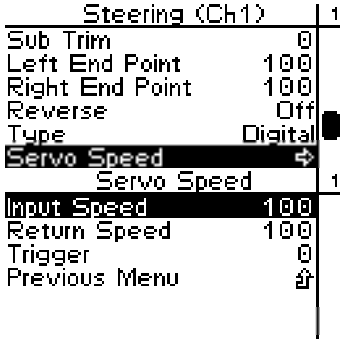
3. Navigate to **Servo Type**.

or

4. Change the value.

Value	Description
Analog	Steering servo is analog.
Digital	Steering servo is digital.

Steering Speed



Steering speed allows you to limit the maximum speed that the steering servo will be driven to match your movements on the wheel. There are three parameters that can be adjusted to precisely set up your limiting.

Trigger sets the minimum amount of control input before the speed limiter becomes active. At 0%, limiting is always active (input is always >= 0%). At 50%, limiting is only active if the wheel is turned half way or more.

Input speed determines the limited speed that is applied to motions away from center that are above the trigger setting. 100 is the maximum servo movement rate. 1 is the minimum rate. Default is 100 (full speed)

	Return speed determines the limited speed that is applied to motions back toward center that are above the trigger setting. 100 is the maximum servo movement rate. 1 is the minimum rate. Default is 100 (full speed)

Changing the Steering Speed

Interaction with other parameters
Servo Speed is applied after Expo. The trigger level for Servo Speed refers to the curved input value.

Use the navigation controls to change the steering servo type as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Steering (Ch1)** menu.

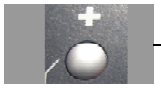
or

then

3. Navigate to **Steering Speed**.

or

4. Change the values.



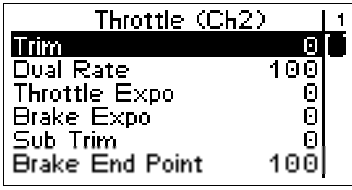
or

Value	Description
Input Speed	The percentage of full speed applied to servo motion away from center once the trigger amount has been exceeded.

Return Speed	The percentage of full speed applied to servo motion toward center once the trigger amount has been exceeded.
Trigger	The threshold above which speed limiting will be applied.

Throttle Functions

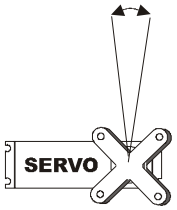
The following illustration shows the function menu structure for the throttle functions:

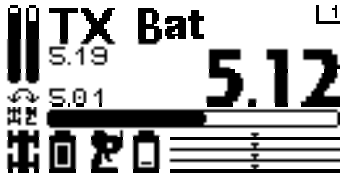


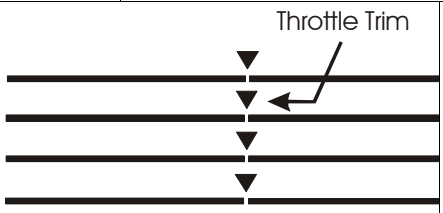
Throttle Trim

Throttle trim adjusts the resting (centered) position of the throttle servo horn (electric or nitro vehicle) or the neutral point of an ESC (electric vehicle).

When initially setting up the vehicle, the throttle trim setting should be set to 0. On a throttle servo, the servo horn should be positioned as appropriate on the servo.







On the driving screen, throttle trim is represented by the position of the pointer on the middle bar.

Changing the throttle trim has the following visual effect on the driving screen bars:

	Throttle trim is centered in range (value = 0)
	Throttle trim is offset to throttle end (+ve value)
	Throttle trim is offset to brake end (-ve value)

Adjusting Throttle Trim using the Function Menu

Use the navigation controls to adjust throttle trim as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

3. Navigate to **Trim**.

or

4. Change the value.

or

Value	Description
0	Throttle trim is centered within servo range.
-ve value (-100 → -1)	Throttle trim is to the BRAKE end.
+ve value (1 → 100)	Throttle trim is to the THROTTLE end.

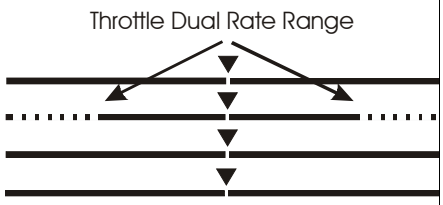
Adjusting Throttle Trim using the Trim Button

You can also use the T3 trim button to adjust throttle trim.

Trim and EPA Interaction

A trim (or sub-trim) setting of 100 is equivalent to an End point setting of 50.

Throttle Dual Rate

	Throttle dual rate adjusts the range of servo movement when the throttle trigger is moved from full brake to full throttle position. This is used to increase or decrease the throttle sensitivity across the entire servo range. The throttle dual rate value is applied to both throttle and brake end, and is expressed as a percentage of servo range (configured by end point adjustments).	
	 On the driving screen, throttle dual rate range is represented by the solid length of the middle bar. The total length of the bar (solid and dotted) represents the servo range. The length of the solid bar represents the servo range set by the dual rate value.	

Changing the dual rate setting has the following visual effect on the driving screen bars:

	Full servo range is used.
	Lower dual rate value reduces servo range.

Adjusting Throttle Dual Rate using the Function Menu

Use the navigation controls to adjust throttle dual rate as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

3. Navigate to **Dual Rate**.

or

4. Change the value.

or

Value	Description
1	Throttle/brake range is set to minimum.
1-99	Throttle/brake range is set to a percentage of full range. For example, value “50” gives 50% of full servo range.
100	Throttle/brake range is set to full (100%)

Adjusting Throttle Dual Rate using the Trim Button

You can also use the T1 trim button to adjust throttle dual rate.

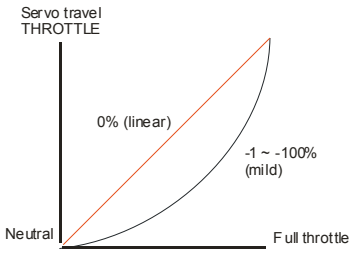
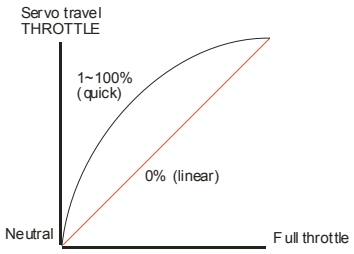
Dual Rate and End Point Adjustment

Full servo range is determined by the throttle and brake end point adjustments. The dual rate value determines the relative servo range between the throttle and brake end points. The servo will never move beyond the set end point adjustments, no matter what dual rate setting is applied.

Throttle Exponential

Throttle exponential adjusts how quickly or slowly the throttle servo responds with respect to the amount that the throttle trigger is moved to the THROTTLE end. This affects the sensitivity of the throttle servo near its neutral position.

Adjusting the throttle exponential does not affect the brake exponential; these settings are set individually.

 **-ve exponential (milder response)**	A negative (-ve) exponential value gives a milder throttle response near the throttle neutral point, making it LESS responsive to small throttle inputs, without changing overall throttle travel like Dual Rate would.
 **+ve exponential (quicker response)**	A positive (+ve) exponential value gives a quicker throttle response near the throttle neutral point, making it MORE responsive to small throttle inputs, without changing overall throttle travel like Dual Rate would.

Adjusting Throttle Exponential

Use the navigation controls to adjust throttle exponential as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

3. Navigate to **Throttle Expo**.

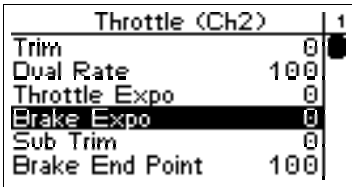
or

4. Change the value.

or

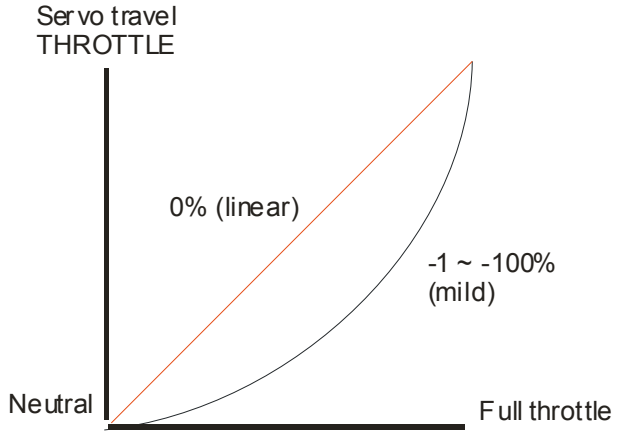
Value	Description
0	Neutral throttle response (linear).
-ve value (-1 to -100)	Milder throttle response near neutral.
+ve value (1 to 100)	Quicker throttle response near neutral.

Brake Exponential



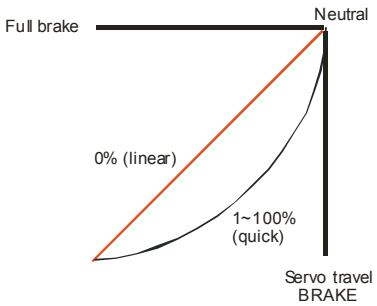
Brake exponential adjusts how quickly or slowly the throttle servo responds with respect to the amount that the throttle trigger is moved to the BRAKE end. This affects the sensitivity of the throttle servo near its neutral position.

Adjusting the brake exponential does not affect the throttle exponential; these settings are set individually.



-ve exponential (milder response)

A negative (-ve) exponential value gives a milder braking response near the throttle neutral point, making it LESS responsive to small braking inputs, without changing overall throttle travel like Dual Rate would.

 **+ve exponential (quicker response)**	A positive (+ve) exponential value gives a quicker braking response near the throttle neutral point, making it MORE responsive to small braking inputs, without changing overall throttle travel like Dual Rate would.

Adjusting Brake Exponential

Use the navigation controls to adjust brake exponential as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

3. Navigate to **Brake Expo**.

or

4. Change the value.

or

Value	Description
0	Neutral braking response (linear).
-ve value (-1 to -100)	Milder braking response near neutral.
+ve value (1 to 100)	Quicker braking response near neutral.

Throttle Sub-Trim

Throttle (Ch2) 1 Trim 0 Dual Rate 100 Throttle Expo 0 Brake Expo 0 Sub Trim 0 Brake End Point 100	Throttle sub-trim adjusts the center point of the throttle servo. This differs from throttle trim in that throttle sub-trim adjusts the servo's entire travel range; by moving the center point of the servo, the throttle and brake end points (throttle, brake) stay the same relative "distance" from the servo center. Throttle sub-trim should be initially adjusted before using throttle trim, which is used to make fine adjustments to center the throttle within the total steering range.	

If you find that you have to use a large amount of throttle sub-trim to adjust the throttle position, you should consider resetting the steering sub-trim to 0 and re-adjusting the servo horn on the servo output shaft.

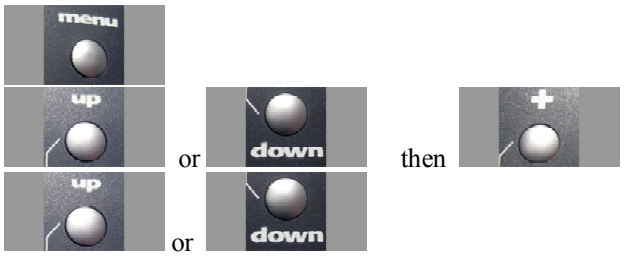
Adjusting Throttle Sub-trim

Use the navigation controls to adjust throttle sub-trim as follows:

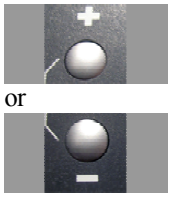
1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

3. Navigate to **Sub Trim**.



4. Change the value.



Value	Description
0	Throttle sub-trim is centered within the servo range.
-ve value (-100 → -1)	Throttle sub-trim is to the BRAKE end.
+ve value (1 → 100)	Throttle sub-trim is to the THROTTLE end.

Trim and EPA Interaction

A trim (or sub-trim) setting of 100 is equivalent to an End point setting of 50.

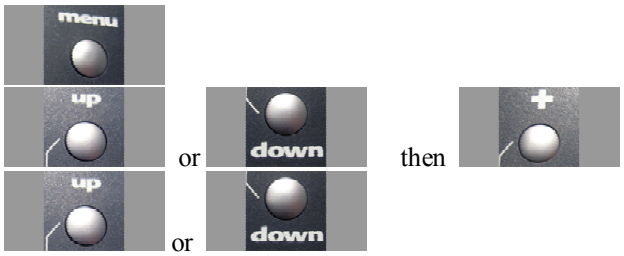
Adjusting Throttle Dual Rate Increment

Use the navigation controls to adjust throttle dual rate increment as follows:

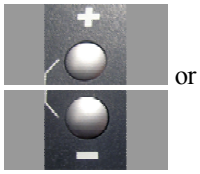
1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu

3. Navigate to **DR Increment**.



4. Change the value.



Value	Description
1-20	Throttle dual rate value changes by set increment. Use smaller values for finer dual rate control. Use larger values for coarser dual rate control.

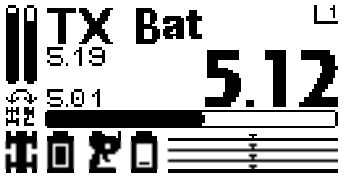
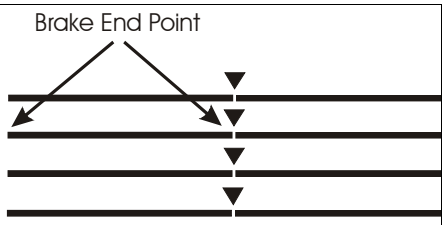
Brake End Point

	The brake end point value adjusts how far the throttle goes to the BRAKE end with respect to its full range of motion to the brake end. End point adjustment should be adjusted prior to other throttle settings, as the brake end point value affects other throttle settings. The brake end point is set independently of the throttle end point (which adjusts how far the throttle moves to the THROTTLE end).	

The brake end point setting should be used to do the following:

Limit throttle throw to reduce mechanical binding or servo strain that may occur on full servo throw to the brake end. For example, if the servo is trying to pull a mechanical brake linkage farther than it is mechanically able.

Adjust braking range to reduce the full braking force of the vehicle.

	On the driving screen, the brake end point is represented by the length of the bar to the left of the pointer on the middle bar. The greater the left length of the bar, the greater the brake end point value. The position of the pointer on the bar is affected by end point settings (throttle and brake) and trim setting.	

Changing the brake end point value has the following visual effect on the driving screen bars.

	Brake end point value is approximately the same as the throttle end point value.
	Increased brake end point value (more servo travel for BRAKING is possible).
	Decreased brake end point value (less servo travel for BRAKING is possible).

The position of the pointer on the bar is affected by end point settings (throttle and brake) and trim setting; increasing the brake end point value may visually appear to have the same effect as decreasing the throttle end point value.

An end point setting of 100 (the default) is typical for most servos, and should always be used for ESCs. Larger setting values will overdrive most servos

Adjusting the Brake End Point

The brake end point value is a relative value, and is expressed as the percentage of full travel to the BRAKE end. For example, setting the brake end point value to “100” allows the throttle to go to only 50% of full brake.

Use the navigation controls to adjust the brake end point as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

3. Navigate to **Brake End Point**.

or

4. Change the value.

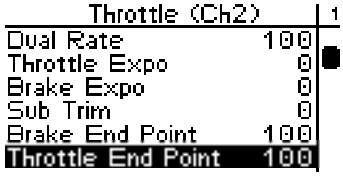
or

Value	Description
0	Minimum brake end point; allows NO brake travel.
1-200	Brake end point value is set to a percentage of full braking travel.
200	Maximum brake end point (will overdrive most servos)

Trim and EPA Interaction

A trim (or sub-trim) setting of 100 is equivalent to an End point setting of 50.

Throttle End Point



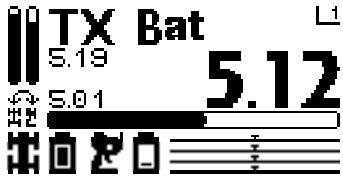
The throttle end point value adjusts how far the throttle goes to the THROTTLE end with respect to its full range of motion to the throttle end. End point adjustment should be adjusted prior to other throttle settings, as the throttle end point value affects other throttle settings.

The throttle end point is set independently of the brake end point (which adjusts how far the throttle servo turns to the BRAKE end).

The throttle end point setting should be used to do the following:

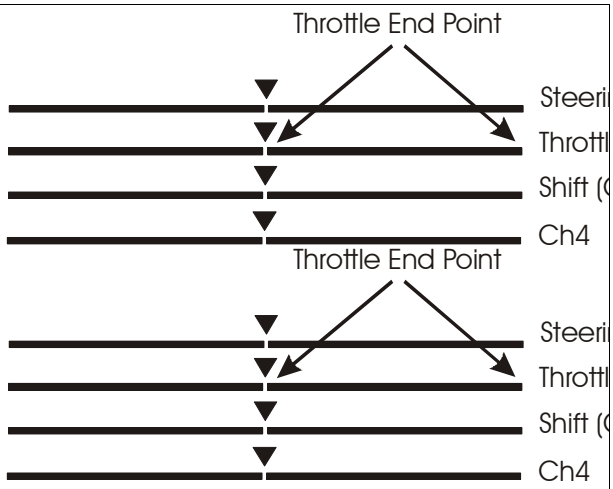
Limit throttle throw to reduce mechanical binding or servo strain that may occur on full servo throw to the throttle end. For example, if the servo is trying to pull a mechanical throttle linkage farther than it is mechanically able.

Adjust throttle range to reduce the top speed of the vehicle.



On the driving screen, the throttle end point is represented by the length of the bar to the right of the pointer on the middle bar. The greater the right length of the bar, the greater the throttle end point value.

The position of the pointer on the bar is affected by end point values (throttle and brake) and trim setting.



Changing the throttle end point value has the following visual effect on the driving screen bars.

	Throttle end point value is approximately the same as the brake end point value.
	Increased throttle end point value (more servo travel for THROTTLE is possible).
	Decreased throttle end point value (less servo travel for THROTTLE is possible).

The position of the pointer on the bar is affected by end point values (throttle and brake) and trim setting; increasing the throttle end point value may visually appear to have the same effect as decreasing the brake end point value.

An end point setting of 100 (the default) is typical for most servos, and should always be used for ESCs. Larger setting values will overdrive most servos

Adjusting the Throttle End Point

The throttle end point value is a relative value, and is expressed as the percentage of full travel to the THROTTLE end.

Use the navigation controls to adjust the throttle end point as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

3. Navigate to **Throttle End Point**.

or

4. Change the value.

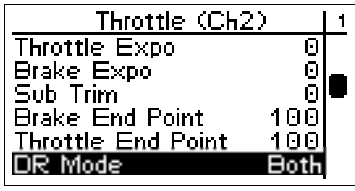
or

Value	Description
0	Minimum throttle end point; allows NO throttle.
1-199	Throttle end point value is set to a percentage of full throttle travel.
200	Maximum throttle end point (will overdrive most servos)

Trim and EPA Interaction

A trim (or sub-trim) setting of 100 is equivalent to an End point setting of 50.

Throttle Dual Rate Mode



Dual Rate Mode controls the behavior of the Dual Rate setting for the throttle servo.

Changing the Throttle Dual Rate Mode

Use the navigation controls to change the dual rate mode as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

3. Navigate to **DR Mode**.

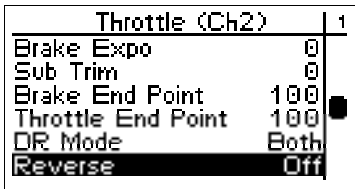
or

4. Change the value.

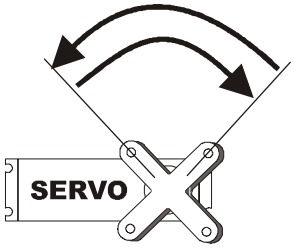
or

Value	Description
Both	Dual rate affects travel in both direction
Throttle	Dual rate affects throttle travel only. Useful to limit throttle inputs early in a run with an electric model.
Brake	Dual rate affects brake travel only. Useful to adjust brakes on a nitro vehicle without affecting throttle travel.

Throttle Servo Reverse



Throttle servo reversing reverses the direction the throttle servo moves upon receiving an input from the throttle trigger.



Changing the Throttle Servo Reverse Setting

Use the navigation controls to change the throttle servo reverse setting as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

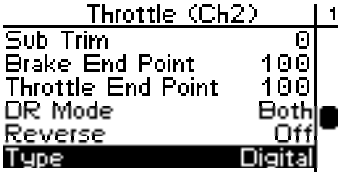
3. Navigate to **Servo Reverse**.

or

4. Change the value.

Value	Description
Off	Standard servo direction.
On	Reversed servo direction.

Throttle Servo Type



Throttle servo type lets you select the type of throttle servo (analog or digital) in the vehicle. Analog servos are sent signals at 50 frames/sec, while Digital servos are sent signals at 100 frames/sec.

If you are running an electric car with an ESC, it may perform better with the digital setting. Some ESCs may not operate at all with the higher frame rate. Try both settings and choose the best performance.

Changing the Throttle Servo Type

Use the navigation controls to change the throttle servo type as follows:

1. Access the top function menu from the driving screen.

2. Navigate to the **Throttle (Ch2)** menu.

or

then

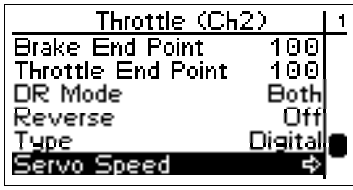
3. Navigate to **Servo Type**.

or

4. Change the value.

Value	Description
Analog	Throttle servo is analog.
Digital	Throttle servo is digital.

Throttle Speed



Throttle speed allows you to limit the maximum speed that the throttle servo will be driven to match your movements on the trigger. There are four parameters that can be adjusted to precisely